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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,987	10/15/2008	**Yusuke Nakamura**	87331-714784 (008500US)	7942

20350 7590 07/11/2011

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EXAMINER	
HOLLERAN, ANNE L	
ART UNIT	**PAPER NUMBER**
1643	

NOTIFICATION DATE	DELIVERY MODE
07/11/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)
	10/586,987	NAKAMURA ET AL.
	Examiner	Art Unit
	ANNE HOLLERAN	1643

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *17-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)	
1) ☒ Notice of References Cited (PTO-892)	4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. ; .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) ☐ Notice of Informal Patent Application
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.	6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :06/2007;09/2009;10/2010;10/2009;10/2010;11/2010;06/2011.

DETAILED ACTION

Applicant's election without traverse of Group I in the reply filed on 4/27/2011 is acknowledged.

Claims 1-20 are pending.

Claims 17-20, drawn to non-elected inventions, are withdrawn from consideration.

Claims 1-16 are examined on the merits.

Claim Rejections - 35 USC § 112-second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 is indefinite because it is drawn to a kit that comprises a polypeptide with a heat shock protein 90A in the presence of a test compound and HSP90A, which is the same as "heat shock protein 90A".

Claims 15 and 16 are indefinite because of the phrase "comprising an contiguous amino acid sequence that selected from the amino acid sequence of SEQ ID NO: 51". The phrase "selected from" indicates more than one amino acid sequence to choose. However, the claims only list one amino acid sequence, that of SEQ ID NO: 51. If applicant intends to use a fragment of SEQ ID NO: 51 in the claims, then an amendment is suggested: "contacting a polypeptide

comprising a fragment of SEQ ID NO: 51, wherein the fragment comprises either or both NHSCDPN (SEQ ID NO: 52) and GEELTICY (SEQ ID NO: 53)".

Claim Rejections - 35 USC § 112-first paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a Written Description rejection.

Claims 1-14 are drawn to kits comprising and methods using polypeptides characterized as a polypeptide comprising the amino acid sequence of SEQ ID NO: 51 wherein one or more amino acids are substituted, deleted, or inserted and said polypeptide has a biological activity equivalent to the polypeptide consisting of the amino acid sequence of SEQ ID NO: 51; or as a polypeptide encoded by a polynucleotide that hybridizes under stringent conditions to a polynucleotide consisting of the nucleotide sequence of SEQ ID NO: 50, wherein the polypeptide has a biological activity equivalent to a polypeptide consisting of the amino acid sequence of SEQ ID NO: 51.

For a claim drawn to a genus, the written description requirement may be satisfied through sufficient description of a representative number of species by actual reduction to

practice or by disclosure of relevant, identifying characteristics, i.e. structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. A "representative number of species" means that the species, which are adequately described, are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus (see Official Gazette 1241 OG 174, January 30, 2001).

The specification provides the structure of ZNFN3A1 (SEQ ID NO: 51). However, the claims encompass using polypeptides that variants of SEQ ID NO: 51, wherein one or more amino acids are substituted, deleted, or inserted, while the biological activity is preserved. The specification provides an in vitro histone H3 methyltransferase assay. Western blot analysis of recombinant H3 protein is examined by incubating the H3 protein with immuno-precipitates in the presence of S-adenosyl-L-methoinine (SAM) and HSP90A using antibodies against mono-methylated, dimethylated, trimethylated, H3K4, total H3 or trimethylated H3-K9 (see page 25 - 26, bridging paragraph). The specification provides mutant-type ZNFN3A1 (page 29, Table 3). Neither of the mutants tested interacted with SAM (page 29). Thus, the specification does not provide examples of mutants that have the required methyltransferase activity for the claimed assays. Additionally, other activities for ZFN3A1 are described in the specification. However, for the methyltransferase activity or any of the other activities of ZFN3A1, there is no correlation between activity and amino acid sequence described; i.e. the specification does not describe

which changes to the sequence of SEQ ID NO: 51 can be made while retaining biological activity.

Therefore, the specification does not provide a representative number of species by actual reduction to practice, because the two mutants provided did not have methyltransferase activity. Additionally, the specification does not provide a disclosure of relevant, identifying characteristics coupled with a known or disclosed correlation between function and structure, because the specification does not disclose which amino acids may be changed while still preserving methyltransferase activity or any of the other biological activities of ZNF3A1. Thus, one of skill in the art would not recognize that applicant was in possession of the claimed invention which encompasses variants of SEQ ID NO: 51, wherein one or more amino acids are substituted, deleted, or inserted; or polypeptides encoded by a polynucleotide that hybridizes under stringent conditions to a polynucleotide consisting of the nucleotide sequence of SEQ ID NO: 50; wherein any of these variants has a biological activity equivalent to a polypeptide consisting of the amino acid sequence of SEQ ID NO: 51.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Santos-Rosa (Santos-Rosa, H., et al., Nature, 419, 407-411, 2002).

Claims 1-4 are drawn to methods using any protein having methyltransferase activity, or specifically H3 K4 (histone H3 lysine 4) methyl transferase activity, where the cofactor is S-adenosyl-L-methionine.

Santos-Rosa teaches a methyltransferase activity where the substrate is histone 3, and the methylation region is lysine 4 of histone 3 (see Figure 1a and 1b; see pages 410-411, bridging paragraph) using SAM as a cofactor. Therefore, Santos-Rosa teaches methods that are the same as that claimed.

Claims 1, 2, 4, 6-8 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 02/092002; cited in the IDS)

Claims 1, 2, 4, 6-8, and 12 read on methods using any protein having methyltransferase activity, because the claims include proteins which have any number of substitutions, additions, and deletions of amino acids to the amino acid sequence of SEQ ID NO: 51. In claim 2 the substate is a histone. In claim 4 the cofactor is S-adenosyl-L-methionine. In claims 6, 7 and 12 there is an enhancing agent which may be s-adenosyl homcysteine hydrolase (SAHH). Therefore, the claims read on methods using any protein with methyltransferase activity.

WO 02/092002 teaches methods for screening of compounds to find those that modulate histone methyltransferase activity (page 2, lines 12-20). WO 02/092002 teaches assays where

the substrate is a histone, the cofactor is S-adenosyl-L-methionine and an enhancing agent is SAHH (see page 50-51, bridging paragraph). Therefore, WO 02/092002 teaches methods that are the same as that claimed.

Claims 1, 2, 4, 8 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Huang (US 6,955,905; issued Oct. 18, 2005; effective filing date Jul. 18, 2001).

Huang teaches a polypeptide that comprises SEQ ID NO: 52 of the instant application (see alignment):

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RESULT 1
US-10-200-012-38
; Sequence 38, Application US/10200012
; Patent No. 6955905
; GENERAL INFORMATION:
;  APPLICANT: Huang, Shi
;  TITLE OF INVENTION: PR/SET- Domain Containing Nucleic Acids,
;  TITLE OF INVENTION:  Polypeptides, Antibodies and Methods of Use
;  FILE REFERENCE: P-LJ 5301
;  CURRENT APPLICATION NUMBER: US/10/200,012
;  CURRENT FILING DATE:  2002-07-18
;  PRIOR APPLICATION NUMBER: US 09/910,478
;  PRIOR FILING DATE: 2001-07-18
;  NUMBER OF SEQ ID NOS: 46
;  SOFTWARE: FastSEQ for Windows Version 4.0
; SEQ ID NO 38
;   LENGTH: 121
;   TYPE: PRT
;   ORGANISM: Human
;   FEATURE:
;   NAME/KEY: VARIANT
;   LOCATION: 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45,
;   LOCATION: 46, 47, 48, 49, 50, 51, 52, 53, 54, 87, 88, 89, 90
;   OTHER INFORMATION: synthetic peptide
;   FEATURE:
;   NAME/KEY: VARIANT
;   LOCATION: 91, 92, 93
;   OTHER INFORMATION: Xaa = Any Amino Acid
;   OTHER INFORMATION: Xaa = Any Amino Acid
US-10-200-012-38

  Query Match             100.0%;  Score 46;  DB 2;  Length 121;
  Best Local Similarity   100.0%;
  Matches    7;  Conservative    0;  Mismatches    0;  Indels    0;  Gaps    0;

Qy          1 NHSCDPN 7
              |||||||
Db         71 NHSCDPN 77
```

Huang teaches methods of measuring methyl transferase activity and methods of screening for compounds that modulate methyl transferase activity, where the substrate is a histone and the cofactor is SAM (see col. 22, line 36 – col. 27, line 34). Therefore, Huang teaches methods that are the same as that claimed.

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huang (supra).

Claim 16 is drawn to a kit for screening for a compound for treating colorectal cancer or hepatocellular carcinoma, wherein the kit comprising a polypeptide comprising SEQ ID NO: 51 and S-adenosyl-L-methionine (SAM).

Huang teaches as set forth above. Huang does not teach kits comprising methyl transferase polypeptides and SAM. However, Huang teaches methods using polypeptides comprising SEQ ID NO: 52 of the instant application and SAM in assays measuring methyl transferase activity for the purpose of identifying compounds that modulate methyl transferase activity. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have assembled a kit comprising methyl transferase polypeptides comprising the amino acid sequence of SEQ ID NO: 52 and SAM, because both of these compounds are required for conducting a methyl transferase activity. Assembling the two products into a kit increases convenience and reproducibility of assays. Therefore, one of ordinary skill in the art would have been motivated to assemble a protein comprising the sequence of SEQ ID NO: 52 and SAM into a kit.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 4, 6- 8, 12, 15 and 16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of copending Application No. 11/912,860 (allowed; not yet patented and assigned no. US 7,968,281). Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-3 are drawn to methods for identifying an agent that modulates methylation of a retinoblastoma peptide by SMYD3, wherein SMYD3 is a polypeptide comprising SEQ ID NO: 2, which is the same as SEQ ID NO: 51 recited in the methods of identifying an agent, and kits

of the instant claims. Therefore, claims 1-3 are encompassed by the claims of the instant application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne Holleran, whose telephone number is (571) 272-0833. The examiner can normally be reached on Monday through Friday from 9:30 am to 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Misook Yu, can be reached on (571) 272-0839. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Papers related to this application may be submitted to Group 1600 by facsimile transmission. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Official Fax number for Group 1600 is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

Anne L. Holleran
Patent Examiner
/Alana Harris Dent, Ph.D./
Primary Examiner, Art Unit 1643